CLAIMS

What is claimed is:

1 A computer implemented process for content-based images search or retrieval with these steps: specifying sample images or/and segments or/and directory and/or directories; specifying training parameters; training by clicking a button in the GUI or Graphical User Interface of the software implementation; specifying the directory or directories to be searched; specifying search parameters; searching by clicking a button in the GUI of the software implementation.

2 A computer implemented process of claim 1, wherein the order of steps is altered to cover all possible combinations.

3 A computer implemented process for image classification with these steps: specifying sample images or/and segments or/and directory and/or directories for each class; specifying training parameters; training by clicking a button in the GUI or Graphical User Interface of the software implementation; specifying the directory or directories to be searched; specifying search parameters; searching by clicking a button in the GUI of the software implementation for each class, and classifying the images by clicking a button in the GUI of the software implementation.

4 A computer implemented process of claim 3, wherein the order of steps is altered to cover all possible combinations.

5 A computer implemented process of claim 1, search process, wherein the steps are saved in the batch code by clicking a Save button, recalled by clicking a file button, and executed by clicking a batch command button in the Graphical User Interface of the software implementation.

6 A computer implemented process of claim 3, classification process, wherein the steps are saved in the batch code by clicking a Save button, recalled by clicking a file button, and executed by clicking a batch command button in the Graphical User Interface of the software implementation.

7 A computer implemented process of claim 1 and 3, further comprising the step of retraining, which allows the system to be trained by more than one image, or segment of an image, or a directory contains images.

8 Claim 8 is deleted..

9 A computer implemented process of claim 1, further comprising output results being listed in a result file, which has a list of names and weights:

a. Wherein the weights of an image are related to the characteristics, which users are looking for.
b. Click the name of each image and an image will be displayed on the screen.

10 A computer implemented process of claim 3, further comprising output results being listed in a result file, which has a list of names and weights:

a. An image link for each image in the search directory;
b. The classification weights of this image in each class; and
c. The classification result of this image as a link.

11 A computer implemented process for content-based images verification, identification, retrieval, and classification with software components, which use IVI-API as an application-programming interface.

12 A computer implemented process of claim 1 and 3, wherein the steps of setting parameters comprises the Internal Representation, which specifies the dimensions of a pixel array used for computation, which may or not be the actual image pixel array.

13 A computer implemented process of claim 1 and 3, wherein the steps of setting parameters comprises the Symmetry, which represents similarity under certain types of changes, such as Intensity, Translation symmetry, Scaling, Rotation, combined Rotation and Scaling, or combination thereof and which is implemented by physically applying the sample image to all possible positions and train the software with all of these transformed images or segments.

14 A computer implemented process of claim 1 and 3, wherein the steps of setting parameters comprises the Sensitivity, or whatever the terminology used, which defines a distance between two neural ABM nets generated by two images in a connection space such that the distance can be used to eliminate unmatched images.

15 A computer implemented process of claim 1 and 3, wherein the steps of setting parameters comprises the Blurring, or whatever the terminology used, which measures the distortion due to data compression, Translation, Rotation, Scaling, Intensity change, and image format conversion and which is implemented by enlarging a single image to a set of images by using the Hausdorff distance, or L1 distance, or L2 distance, or multiple distances define the radius of the set.

16 A computer implemented process of claim 1 and 3, wherein the steps of setting parameters comprises the Shape Cut, or whatever the terminology used, which defines a distance between two images in an image space such that the distance can be used to eliminate unmatched images..

17 A computer implemented process of claim 1 and 3, wherein the steps of setting parameters comprise the Image Type, which specifies ABM or APN algorithm.

18 A computer implemented process of claim 1 and 3, wherein the parameter is provide in a file, which specify more complicated setting than the graphical user interface.

19 The ABM learning algorithm and the methodology of this algorithm of using the connection space to generate connections rather than a process of repetitions of modifying weights directly and observing the performances; the APN learning algorithm and the methodology of this algorithm of converting a binary neural net to a multi-valued neural net by deploying a mapping for each connection; the ABM recognition algorithm and the methodology of this algorithm of classifying images via the stable distributions of the Markov chain; and the APN recognition algorithm and the methodology of this algorithm of extending binary neural net results to multi-valued neural net results by computing a distance between the two images.

20 Claim 20 is deleted.